

Veritex(TM) Patches for Structural Repair and Re-Use, Phase I

Completed Technology Project (2005 - 2005)



Project Introduction

Cornerstone Research Group, Inc. (CRG) proposes to develop a bonded composite patch repair and re-use system based on CRG's Veritex

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materials. Veritex

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is a composite material consisting of common reinforcement fibers such as e-glass or carbon and one of CRG's shape memory polymers. Veritex

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is a fully-cured, stiff thermoset composite at most system operating temperatures, yet it can be made to be flexible by heating it above an activation temperature. This feature enables the use of Veritex

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as a composite patch system that is shape-adaptive and can be used for repair of many different types of structural members and/or for joining of structural members to assemble new systems. The development of a simplified patch repair and re-use system will enable effective and efficient structural material repair and system assembly that can be performed by humans as well as robots. This technology will require less material and energy resources than the current state-of-the-art for terrestrial bonded composite patch repair making it a desirable solution for current and future self-sufficient space systems. This repair and re-use technology could find immediate implementation on current NASA platforms such as the International Space Station and future implementation on platforms such as the lunar excursion vehicle.

Anticipated Benefits

This project's technologies developed for NASA systems would directly apply to systems operated by other government and commercial enterprises. Government systems that would derive the same benefits would include but not be limited to aircraft structures, marine structures, shelter structures, and many other structural systems operated by all agencies of the Department of Defense. This technology's attributes for streamlined repair should yield a high potential for private sector commercialization for repair systems for many types of space-based and terrestrial structural systems. This project's technologies directly address requirements for servicing, maintenance, and repair for space-based structural components. This project's technologies offer an effective solution for a wide variety of structural repair and assembly situations with the additional benefit of being lightweight and low-volume. This technology will require less material and energy resources than the current state-of-the-art for terrestrial bonded composite patch repair making it a desirable solution for current and future self-sufficient space systems. This



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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Kennedy Space Center (KSC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

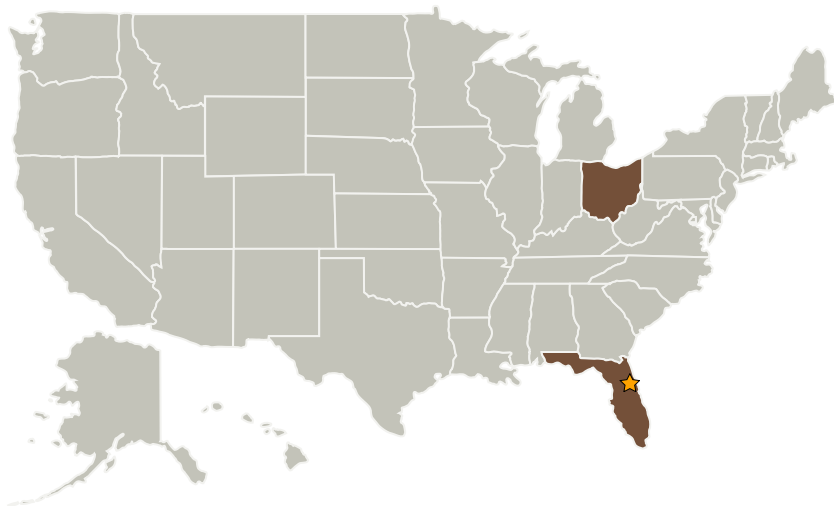
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repair and re-use technology could find immediate implementation on NASA platforms such as the International Space Station and the lunar excursion vehicle.

Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
★ Kennedy Space Center(KSC)	Lead Organization	NASA Center	Kennedy Space Center, Florida
Cornerstone Research Group, Inc.	Supporting Organization	Industry	Miamisburg, Ohio

Primary U.S. Work Locations

Florida	Ohio
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Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Project Manager:

Thomas C Lippitt

Principal Investigator:

Ben Dietsch

Technology Areas

Primary:

- TX07 Exploration Destination Systems
 - └ TX07.2 Mission Infrastructure, Sustainability, and Supportability
 - └ TX07.2.3 Surface Construction and Assembly